



## **Disjunct eddy accumulation flux measurements of individual VOCs from an urban environment**

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As part of the MILAGRO-2006 study a flux tower was deployed at urban Mexico City to measure turbulent fluxes of trace gases. Fluxes of individual volatile organic compounds (VOCs) were measured using a disjunct eddy accumulation (DEA) sampler with ionization detector/gas chromatography (GC-FID) analysis.

The DEA method partitions the air into two reservoirs based on the magnitude and direction of the vertical wind speed. The VOCs concentrations in both reservoirs are analyzed and used to determine the fluxes with the vertical wind velocities. Although this method is not as precise as other micrometeorological techniques, such as the eddy covariance method, it provides the ability to directly measure the fluxes of an extended number of individual species using off-line sensors without relying on similarity scaling or empirical parameters.

According to our knowledge these measurements constitute the first time that the DEA method was applied in an urban environment. A comparison of the DEA fluxes of selected aromatic and olefinic species measured in parallel by the more accurate eddy covariance and disjunct eddy covariance techniques coupled with fast-response analytical sensors evidenced a flux under-prediction by the DEA method. However, this under-prediction was consistent and constant for the species compared, allowing an analysis of the DEA fluxes in terms of relative magnitudes and ratios. It was found that fluxes of alkane species were the dominant VOCs fluxes, which is consistent with ambient concentration measurements and the local emissions inventory. Among the top 20 mean VOCs fluxes measured during daytime, 11 corresponded to alkanes, followed by 5 aromatics, 2 olefins, 1 alkyne and 1 oxygenated.